UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

APR 09 2003

MEMORANDUM

SUBJECT: MPRSA Emergency Ocean Dumping Permit for Partially Treated Wastewater from the Abandoned Piney Point Facility

FROM: James D. Giattina, Director
Water Management Division

TO: J. I. Palmer, Jr., Regional Administrator
U.S. EPA Region 4

Attached for your signature is the emergency ocean dumping permit for partially treated wastewater from the abandoned Piney Point facility pursuant to Section 102a of the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972. The wastewater is "industrial waste" as defined in Section 102a(b) of the MPRSA, i.e., "solid, semi-solid, or liquid waste generated by a manufacturing or processing plant." This emergency permit allows the Florida Department of Environmental Protection (FDEP) to transport for the purpose of dumping (through dispersal) and to dump (through dispersal) double-lime with aeration treated wastewater from an abandoned phosphate fertilizer manufacturing facility into the Gulf of Mexico. This permit is being sought to prevent a large scale spill of untreated wastewater from the facility onto the site, thereby endangering the lives of personnel at the facility who operate wastewater treatment systems and who maintain and provide emergency repair of the dike system. In addition, a failure of the dike system could release greater than 100 million gallons of untreated, acidic wastewater, flooding a major hurricane evacuation highway and emptying into Tampa Bay, an inland bay of the Gulf of Mexico.

It must be noted that the dikes are 50 to 70 feet above grade and contain over 800 million gallons of acidic process wastewater. A geotechnical study completed in November 2001 by Ardaman & Associates, Inc., concluded that there is evidence of undesirable design and construction features that have led to historical poor performance of the impoundment and gypsum stack embankments. Furthermore, the dikes are under routine surveillance and inspection due to the risk of piping failures resulting from concentrated seepage following fissures or cracks within the gypsum stack and along the gypsum/soil interface. The risk of failure is greatly enhanced when water levels in the impoundments are raised above dike design levels. Concentrated seepage, including boils and springs are routinely observed at the toe of the dike system. Thus far, significant piping events have been contained through the rapid response of personnel. However, such response becomes much more difficult and dangerous under high water levels with storm conditions. A 'non-critical" cavity 8-12 feet wide and at least eight

feet deep developed rapidly on March 5, 2003, on one of the smaller cooling pond dikes. While this event did not result in the release of wastewater beyond the seepage collection ditches, it is indicative of the inherent instability of the dike system. In light of this study and the recent history of dike problems (cracks, boils, and collapses), EPA and FDEP have concluded that there exists a high likelihood of a dike failure when pond levels exceed normal operating levels. This conclusion is supported by the Florida Division of Emergency Management, which concluded after a site visit that an emergency does exist at the site and that if above average rainfall occurs this year, it is likely that a catastrophic event could occur (March 13, 2003 letter from Colleen M. Castille to FDEP).

Therefore, I am recommending issuance of this emergency permit because I believe that an emergency has been demonstrated to exist which poses an unacceptable risk to human health and admits of no other feasible solution, thereby requiring the disposal of this waste at sea. In addition, in accordance with 40 CFR 222.1, I have applied the criteria set forth in 40 CFR Parts 227 and 228 in developing this recommendation. The basis for my recommendation is discussed in the following sections.

BACKGROUND

According to the applicant, FDEP, prior to 2000, the former Piney Point Phosphates, Inc. (PPPI or Piney Point) operated a phosphate fertilizer manufacturing complex at a location along U.S. Highway 41 approximately six miles north of the city of Palmetto in Manatee County, Florida. The complex consisted of: (1) a sulfuric acid plant with associated molten sulfur storage tanks; (2) a phosphoric acid plant with an associated phosphogypsum stack system; (3) an ammoniated phosphate fertilizer plant with storage of ammonia, phosphoric acid, and dry products; and (4) the infrastructure necessary to support these operations. The existing phosphogypsum stack system is comprised of the old and new gypsum stacks, each incorporating two 50 to 70-foot high impoundments on top of the stacks, two process water ponds (designated south and north cooling ponds), and a network of seepage collection ditches and process water re-circulation ditches encompassing a total watershed on the order of 452 acres.

In February 2001, PPPI filed a petition for protection from creditors in the U.S. Bankruptcy Court in Tampa, Florida. Prior to filing, PPPI notified the FDEP that PPPI was financially incapable of maintaining the Piney Point gypsum stack system to prevent a release of the 600 million gallons of untreated, acidic process wastewater ponded onsite at that time. Since June 2001, FDEP and a Court-appointed Receiver have been actively implementing remedial measures to increase the surge storage capacity of the system and to consume excess process water from the inactive phosphogypsum stacks.

Perimeter dike restorations and raising of the gypsum dike crest elevations were expeditiously undertaken and optimized to maximize the surge storage capacity of the system and allow for containment of an additional 141 million gallons (MGal) of contaminated rainfall-runoff. Approximately 150 million gallons of process wastewater were consumed between September 2001, and the end of calendar year 2002 through discharge of reverse osmosis (RO) permeate and lime treated water to

Bishop Harbor and Tampa Bay, and transfer of process water and treated water to other industrial facilities and waste water treatment plants. The rate of consumption of water was being severely hampered all along by "start-up" difficulties attributed to the use of unproven technologies, concerns about environmental impacts in Bishop Harbor and Tampa Bay, and suspension of transfers to other facilities that are wet-weather sensitive.

Because the plant has been shut down and the watershed of the stack system is greater than ponded areas within the system, the facility has a net accumulation of water even during a normal rainfall year. According to FDEP, the inventory of wastewater at the site increased by more than 280 million gallons during calendar year 2002, thus not only negating all benefits realized through process water consumption over the preceding 18-month period, but also filling much of the remaining increased surge storage capacity in the system realized by raising the dikes. During December 2002, the Piney Point phosphogypsum stack system was subjected to as much as 16.5 inches of rainfall (14.3 inches above normal), a historic record and an extreme event with a 500-year return period. As a result, closure activities which had been initiated in November 2002 had to be suspended on December 31, 2002 in order to contain the high wastewater inventory. In January 2003 the FDEP issued an emergency order to discharge partially treated wastewater into Bishop Harbor in order to protect public health and safety and the environment.

JUSTIFICATION FOR EMERGENCY PERMIT

Under Section 102a of the MPRSA, 33 USC 1412a, EPA may issue emergency permits for the dumping of industrial waste into ocean waters if EPA determines that there has been demonstrated to exist an emergency, requiring the dumping of such wastes, which poses an unacceptable risk relating to human health and admits of no other feasible solution. "Emergency" as defined by Section 102a(a) refers to situations requiring action with a ***marked degree of urgency***. The London Convention, which is the international convention on ocean dumping, also provides that a Contracting Party may issue a permit for the ocean dumping of industrial waste in emergencies, posing unacceptable risk relating to human health and admitting no other feasible solution. Emergency permits are also referenced in 40 CFR Section 220.3(c). The section identifies the three factors mentioned above and also provides that the term "emergency" is not limited in its application to circumstances requiring immediate action. The regulations also provide that, in addition to the factors mentioned above, the issuance of such a permit without prior notice must be based upon a finding that the public interest requires issuance of an emergency permit as soon as possible [40 CFR Section 222.3(b)(3)]. The following is a discussion of each of these four factors.

1) That there has been demonstrated to exist an emergency.

The abandoned phosphogyspsum stack system at the former Piney Point Phoshate fertilizer manufacturing complex is comprised of an old and new gypsum stack, each incorporating two 50 to 70 foot high impoundments on top of the stacks and two contact process water ponds. These

impoundments, with a design capacity of 890 million gallons, contain untreated acidic (pH≅2.5) process wastewater. The volume of water is supplemented significantly by rainfall falling on the ponds and the surrounding watershed. Upon contact with the ponds and/or the surrounding gypsum stacks, the rainwater also becomes contaminated.

Due to bankruptcy of PPPI, the manufacturing complex ceased operations in the year 2000. While in operation, the plant consumed an average of 2.5 million gallons per day of contact water. The bankruptcy and subsequent discontinuation of plant operations has resulted in a net gain of water in the facility with each significant rainfall event. Since bankruptcy, the FDEP has been aggressively developing innovative technologies to treat and re-use the water from the facility, but has been unable to keep up with the volume of wastewater created by rainfall on the site.

The inability to treat and dispose of sufficient quantities of wastewater due to a lack of alternatives creates an emergency situation of a continuous threat of a catastrophic spill of untreated acidic wastewater from either overtopping or structural failure of one or more of the impoundments. The risk of structural failure is enhanced when water levels in the impoundments are raised above design levels. A geotechnical study completed in November, 2001 by Ardaman & Associates, Inc., concluded that there exists evidence of undesirable design and construction features at PPPI. Additionally, the Florida Division of Emergency Management determined through an on-site visit (March 13, 2003 letter from Colleen M. Castille) that an emergency does exist at the site and that if above average rainfall should occur this year, it is likely a catastrophic event could occur. In light of the Ardaman Study and the recent history of dike problems (cracks, boils, and collapses), EPA and FDEP have concluded that there exists a high likelihood for a dike failure when pond levels exceed normal operating levels.

This emergency situation has been created in part by higher than anticipated rainfall from September to December 2002 and the higher than normal rainfall expected this year. Hurricane conditions are prevalent in the Gulf of Mexico from June 1 to December 1 each year. The excessive rainfall in December 2002 created a threat of an imminent spill as remaining storage capacity (including emergency freeboard) was reduced to less than that required to contain a 100-year 24 hour storm event. Therefore, it is expected that emergency conditions will persist through November 2003.

In order to alleviate the emergency situation, the FDEP has estimated and we are satisfied that it must consume (remove from the site) from 484 to 700 million gallons of wastewater, depending on rainfall, through all alternatives by November 30, 2003. This volume is required in order to maintain capacity at the facility within the early emergency discharge trigger levels and to have adequate capacity at the end of the rainy and hurricane season for stabilization of the facility for the following year. Emergency early discharge trigger levels were developed by the FDEP utilizing hydrologic analysis and a statistical analysis of 112 years of rainfall data from the Bartow NOAA weather station to determine the monthly capacity thresholds requiring varying levels of consumption. Exceeding the early emergency discharge trigger levels could result in an inability to treat (double-lime with aeration) and discharge sufficient quantities of wastewater to prevent overtopping or structural failure. For the greatest confidence

(99.5%) in preventing a catastrophic spill at the facility, 700 million gallons must be consumed. This confidence level is based on an annual rainfall quantity of 84 inches which has a 99.5% chance of not being exceeded based on FDEP's statistical analysis of 112 years of rainfall data at the Bartow NOAA weather station. Consumption of less water (484 million gallons) prior to November 30, 2003 will provide for a lesser degree of certainty (91% corresponding to 67 inches of rainfall) in protection of human health and safety and the environment, and will leave the facility in the same condition as in December 2002 when an extreme rain event nearly topped the dikes.

The FDEP rainfall statistics were compared against National Weather Service Climate Prediction Center forecasts for central Florida and found to be reasonable. As discussed in the following section, alternative treatment and disposal options are expected to achieve 165.3 million gallons of consumption through November, resulting in an emergency deficit of 534.7 million gallons. Ocean disposal is therefore needed for 534.7 million gallons of partially treated wastewater.

2) That the emergency poses an unacceptable risk relating to human health.

FDEP has identified the most likely failure events as including: 1) a dike breach resulting from wind surge and wave-induced overtopping, with subsequent rapid erosion and failure of the dike wall; 2) a dike breach due to collapse resulting from piping of the foundation spills; 3) a dike breach due to a stability failure triggered by concentrated seepage or overtopping surface water flow; and 4) piping failure resulting from concentrated seepage following existing cracks within gypsum and along the interface between the gypsum and foundation soils. A sudden dike failure could result in a major process water spill (i.e., an uncontrolled discharge) in excess of 100 million gallons.

The possibility of dike failure and/or overspilling of the dikes presents a real threat to human health and safety in terms of loss of life or injury to those in the path of flood waters. This risk is to those 15-25 workers operating the wastewater treatment system who are in danger of drowning or injury due to acute exposure to wastewater should a dike failure occur in a location that would send over 100 million gallons of acidic waters through the plant site. Also, risks are high for those personnel responsible for remedial actions to repair dikes during failures, particularly during storm conditions. Risk to human safety is not limited to the on-site personnel at the facility since the South Cooling Pond is located only about 400 feet east of the right-of-way of U.S. Highway 41 (a major hurricane evacuation route) and less than 100 feet north of Buckeye Road. A 5-foot deep dike breach along Buckeye Road could result in a peak uncontrolled discharge rate in excess of 1 million gallons per minute. At this rate, high-velocity flow at water depths greater than 3 feet could occur without warning across Buckeye Road. The wastewater flow would be conveyed westward and, in less than one minute, could overtop U.S. Highway 41 at a water depth greater than one foot at a water velocity of approximately 10 feet per second. This situation would pose a threat to persons in the vicinity and to vehicular traffic present on the roads.

In addition, the populations of a number of communities south of Piney Point, including the cities of

Palmetto and Bradenton, plus several smaller towns and unincorporated areas, would have to be diverted west to I-75 and other smaller highways or possibly be stranded due to flooding in the event that U.S. Highway 41 were closed or flooded during a hurricane evacuation due to dike failure. Conservative estimates based on 1990 U.S. census data suggest that up to 300,000 people may be required to find alternate evacuation routes in such an event.

A scientific panel of experts from locations across the United States' portion of the Gulf of Mexico was convened by the Tampa Bay Estuary Program at EPA's request to consider the relative risks of ocean dispersion of the wastewater versus continued discharges to the Bay. Among the risks associated with the increased nitrogen load are increased phytoplankton concentrations and associated declines in water clarity, seagrass loss due to decreased light availability, and dinoflagellate and other algae blooms, including harmful algal bloom species (HABs), such as the toxic red tide organism *Karenia brevis*. Previous emergency discharges into Bishop Harbor have resulted in algal blooms and, as a result of the current discharges, an algal bloom (*Prorocentrum)* has been reported in Bishop Harbor.

The *untreated* wastewater is acidic and contains high levels of ammonia and phosphorus and several metals (i.e., aluminum, arsenic, cadmium, iron, manganese, nickel, and zinc), and small amounts of low level radioactivity from natural elements. A catastrophic release of untreated wastewater to Bishop Harbor/Tampa Bay would cause immediate fish kills in the Harbor, designated as an Outstanding Florida Water. A spill of 50 million gallons of similar wastewater into the Alafia River east of Tampa Bay in1997 killed most of the flora and fauna for over 30 miles of river.

The unanimous consensus among the scientific panel was that "dispersing the ammonia-enriched wastewater in the Gulf of Mexico posed fewer ecological and health risks than continuing the discharge into Tampa Bay" (February 27, 2003 letter from Richard M. Eckenrod, Executive Director, Tampa Bay Estuary Program). The greatest risk posed by offshore dispersion was the possibility of triggering a HAB that would subsequently move into nearshore waters. As a result, the panelist recommended that dispersion should occur greater than 40 miles off shore and that ocean dispersion should only be used as a stopgap measure over the short-term until other options could be implemented to relieve the emergency conditions.

3) That admits of no other feasible solution.

The FDEP has over the last two years been aggressively pursuing innovative alternatives for the treatment, disposal and re-use of this waste. These efforts have proved only successful enough to remove 145 million gallons in calendar year 2002. As discussed above, 700 million gallons must be removed through the period ending on November 30, 2003 in order to alleviate the emergency situation. An analysis of alternatives has been conducted by the applicant. It has determined that as much as 165.3 million gallons may be removed by the alternatives that can be utilized between February 1 and November 30, 2003. A summary of the alternatives evaluated by FDEP is provided below. Each alternative is followed by an estimated capacity if found potentially feasible to a degree

where consumption volumes can be estimated. Reliable options were used in calculating the 165.3 million gallons estimate discussed above. The alternatives are inclusive of those required by 40 CFR 227.15(c) to be evaluated as part of an ocean dumping permit. Unless otherwise stated, all costs described below are based on the need to treat or

dispose of approximately 535 million gallons of wastewater to alleviate the emergency situation at the facility. All volume estimates are based on consumption over the period February 1, 2003 to November 30, 2003.

Landfill Disposal

According to the FDEP, bulk liquids are prohibited from being disposed of in Florida landfills. Therefore, in order to landfill this waste, it would require stabilization with cement followed by disposal in a class 1 landfill. Stabilization would require 10,750 cubic yards of cement per million gallons of waste. The availability of sufficient quantities of cement is questionable and would cost greater than $995 million. FDEP has estimated that the stabilization material is likely to occupy more than 3,200 acre-feet and that this landfill space may not be readily available. EPA also asked FDEP to consider disposal of the stabilized material on or near the site. FDEP determined that on site disposal would threaten the integrity of the gypsum stack liners planned for closure of the facility. This threat occurs due to the weight of the stabilized material, and the fact that the material has a tendency to crack over time. Settlement within the gypsum stacks is anticipated to be 2 to 3 feet per year. This, combined with the cracking of the material, would most certainly puncture the liners. The logistics of removing, stabilizing, and replacing the required quantity of material while installing liners for closure would be quite challenging, if not impossible. Additionally, disposal of stabilized material on adjacent land would only be sufficient to contain 12.5% of the material. Total costs for this option are estimated at greater than $995 million. Therefore, this alternative is not considered feasible.

Well Injection

The use of existing (and development of new) Class I and Class V wells was evaluated by FDEP and EPA. It was determined that there are constituents in both the treated and non-treated process water that exceed primary drinking water standards and, therefore, it cannot be injected into a Class V well. There are several existing Class I municipal wells in the area. However, to inject the wastewater directly into the municipal wells, the wells would have to be modified to become industrial wells requiring physical modification. The associated engineering for the new well designs and modification of the permits are lengthy processes.

FDEP identified one existing Florida industrial/hazardous waste injection well located within 60 miles of the facility. However, this well was rejected due to limited capacity (0.27 mgd), the lengthy permitting process, and incompatibility with the existing waste stream at the well. On site development of a Class I well was also considered by FDEP and EPA. In order to develop such a well, an exploratory well

would have to be approved, drilled, and tested. Construction and permitting would then be required. FDEP has estimated the time required to develop a well to be from two to four years.

Three other Class I non-hazardous waste disposal wells were investigated in Louisiana. All locations were limited by the logistics of getting the wastewater to the waste disposal well site. For example, the location with the greatest available capacity (Clean Harbor, Plaquemines LLC) can offload directly from barges at a rate of approximately 300,000 gallons over 40 hours. At this rate it would take over eleven days to offload two million gallons, the volume that needs to be removed from the Piney Point Facility each day.

FDEP also considered the use of Class II wells to dispose of the Piney Point wastewater. The nearest Class II well is 75 to 100 miles southeast of the Piney Point facility. The issues of fluid compatibility and limited capacity to transport and accept wastes preclude this alternative.

Therefore, use of underground injection is not considered a feasible alternative due to logistical, as well as, time constraints.

Incineration

FDEP evaluated the incineration option in 2002. While technically feasible it is not timely because it is estimated that it would take 18 months to construct the needed systems. The cost of incineration was estimated in the range of $28 to $56 per 1,000 gallons of waste or $15 to $30 million for treatment of the waste. Therefore, this alternative is not considered feasible due to time constraints.

Land Application

Two land application alternatives were considered by FDEP. The first alternative involved applying the waste to land at, or adjacent, to the facility. FDEP determined that levels of sodium, sulfate, and total dissolved solids would exceed Florida's ground water quality standards and also adversely affect citrus and vegetable crops and a variety of sods even if it were treated utilizing the double-lime with aeration treatment process. In addition, land values would make this alternative very expensive.

The second land application alternative evaluated was the dilution of the treated process water and transfer to the Manatee County regional treatment facilities, using their land application infrastructure. This alternative has been and is being utilized, to its practical extent. However, this alternative is very wet-weather sensitive and reliable only during certain times of the year. It cannot be used during the rainy season (June through October) and may be questionable at other times due to the prediction of higher than normal rainfall this year. The potential consumption volume estimates for the land application alternative at Manatee County is 21.4 MG with transfers only occurring during March to June 15 and October through November, 2003. Costs for this alternative are $33 per thousand gallons or approximately $706,200. Therefore, this alternative is potentially feasible for the disposal of a

portion of the waste, but is not immediately available due to wet weather.

Re-Use

FDEP has evaluated and utilized multiple re-use alternatives. Past utilization of this alternative has included re-use of the wastewater by CF Industries, Inc. (CF), a similar phosphate manufacturing complex. However, rainfall levels in 2002 have threatened CF's surge storage capacity and will prevent this option from being used again until 2005. Cargill Fertilizer also reused wastewater until the rain events of 2002 caused similar problems with its capacity. Cargill currently accepts about 375,000 gallons per week, but will not sustain this reuse once wet weather arrives. FDEP has determined that only half (4.9 MG) of the potential consumption capacity of the Cargill facility is a reliable and feasible option. The Florida Power and Light (FPL) Company also operates a large electric generating plant that uses the process water. However, FPL limits the quality of the water to ammonia concentrations of less than 20 mg/l. This level can only be achieved at lower treatment rates at the Piney Point facility. Additionally, FPL will not be able to accept wastewater after June 2003 due to construction activities at the FPL facility.

Storage

On-Site Storage

FDEP has investigated and implemented increasing the on-site storage capability. They have increased storage at the site by 140 million gallons by raising the height of the existing dikes to a maximum of 50 to 70 feet. The existing dikes cannot be increased. At the request of EPA, FDEP evaluated the addition of storage beyond the footprint of the phosphogypsum stack system. They determined that they could create an additional 135 million gallons of storage in adjacent areas, utilizing a pond with a maximum footprint of 28 acres and a perimeter dike height of 28 feet. However, this would increase the watershed of the facility, thereby substantially increasing the amount of contaminated rainfall to be treated and disposed. Construction of a pond of this size would severely restrict routing of runoff from extreme storm events around the plant, and would aggravate flooding conditions. A smaller pond could be constructed encompassing 12 acres and yielding a storage capacity of 45 million gallons. However, this will result in a net gain of 5 to 9 million gallons of water per year, or about 20% of the increased capacity. Consultation with mining waste authorities at the EPA Environmental Response Team confirmed that increased storage for these types of facilities is not a feasible option.

Off-Site Storage In Barges or Tankers

Given the volume of wastewater to be disposed, EPA and FDEP has concluded that this alternative is not feasible due to the number of vessels needed to store the wastewater and the

inability to tie up available dock space for extended periods of time. For example, FDEP estimated that wastewater would need to be stored for a 2-3 year period.

Construction of a Secondary Containment Around the Stacks to Minimize Threats to Human Health and Safety

Land areas between the Piney Point gypsum stack system perimeter and the facility property boundaries on the north, east, and south sides of the stack are very narrow and not adequate for the construction of earthen dikes for secondary containment. There exists usable land to the west of the stack system that could possibly be developed to provide partial containment of untreated wastewater in the event of a spill resulting from a breach of the west or north walls of the stack. The usable area is approximately 10 acres and the height for a secondary containment dike would be limited to seven feet. Construction of such a facility would require extensive modifications to the drainage and existing pipeline system on the west side of the facility. In addition, greater than 35,000 cubic yards of soil will need to be located, hauled and compacted to construct the secondary dike. The construction period would exceed four months. Furthermore, the maximum detention capacity of the secondary dike would be less than 25 MG, less than 25% of the potential spill volume of 100 MG expected in the event of a 5-7 foot breach of one of the gypsum dikes. This alternative would do nothing to relieve the emergency conditions at the site and is, therefore, not considered feasible at this time.

Construction and Use of "Floating Covers" to Prevent Rainfall from Entering the Ponds

The purpose of this alternative would be to prevent the contamination of rainwater by separating it from the contaminated process water and the gypsum dikes. The ponds on top of the dike system range in size from 25 to 75 acres. Key technical issues and the problems associated with developing such an alternative include:

- considerable stresses caused by high winds and wind-generated waves causing tearing of the membrane;
- a feasible means of anchoring the membrane to the dike structure;
- the ability to capture rainfall and route it for disposal before contamination;
- installation of the membrane when the pond is full, as in the current condition, which would require fusion welding over the water or welding in a remote location and unrolling extremely large sheets over the existing wastewater;
- routing contaminated runoff from the gypsum stacks due to seepage back to the process pond *below* the floating membrane; and
- replacing the existing vertical decant structures which are not compatible with floating membranes.

In addition, installing a floating membrane will yield limited benefit from a water balance or net water consumption standpoint. Such a cover will essentially eliminate evaporation of wastewater from the

elevated impoundments. Benefits from the diversion of rainwater away from the dike system is substantially reduced by the reduced evaporation losses from the system. Therefore, this alternative is not considered feasible.

Decant Rainfall Falling onto the Ponds Before Contamination

Rainfall falling onto the pond areas mixes almost instantaneously with contaminated water because of wind action, waves, recirculated seepage, and routing water between seven ponded areas on a continuous basis. The pH and specific conductance of the pond water does not vary with depth to any significant extent. Therefore, it is not possible to collect and decant rainfall falling onto the wastewater ponds.

Surface Water Discharges after Additional Treatment

The wastewater at the facility is treated at a minimum using a lime precipitation, aeration, and sedimentation process. This process is designed to precipitate fluoride, phosphorus, metals and radionuclides. Further treatment of the waste beyond the double-lime process could allow for surface water discharges to Bishop Harbor or other surface waters. Additional treatment alternatives identified by FDEP and EPA include:

Reverse Osmosis (RO)

FDEP has been utilizing RO technology since July 2002 to treat a portion of the waste followed by disposal into Bishop Harbor. The RO technology produces a high quality water that can be discharged to surface waters. However, RO has not yet been demonstrated to be sustainable for use with this type of wastewater due to frequent fouling of the filters and membranes and the fact that the byproduct results in an increase in the mass of pollutants in the wastewater, gradually decreasing the effectiveness of the process. RO at this time and in the foreseeable future is limited to 0.3 mgd. FDEP is attempting to increase RO capabilities by an additional 0.9 mgd but has been unable to secure a contractor to commit to such volumes. Therefore this treatment alternative is considered a feasible alternative for treatment and disposal of approximately 82.5 MG of the wastewater, with an estimated cost of $1.7 million.

Membrane Separation

FDEP has investigated utilizing a membrane ammonia separation process for treatment of the wastewater followed by discharge to surface waters. FDEP is negotiating with a contractor to supply a membrane ammonia separation process. However, this process is unproven, would require a 6 month minimum start-up time and would require confirmation that surface water discharges of the treated water would be permissible under the Clean Water Act. The earliest this alternative could be implemented would be July of 2003 at a rate of 0.2 to 2.0 mgd.

Therefore, this alternative is not considered feasible at this time due to time constraints and the unreliability of the technology.

Break-Point Chlorination

FDEP has investigated utilizing break-point chlorination as a means of eliminating the ammonia in the lime treated process water followed by discharge to surface waters. They are currently testing this technology, however; it would also require confirmation that surface water discharges of the treated water would be permissible under the Clean Water Act. The earliest this alternative could be implemented would be July of 2003 at a rate of 1.0 to 2.0 mgd. Therefore, this alternative is not considered feasible at this time due to time constraints and the unreliability of the technology. However, if and when this technology comes on-line, any amounts treated and discharged will be deducted from the amount authorized for ocean disposal.

Transfer to Advanced Wastewater Treatment (AWT) Plants for Surface Discharge

FDEP has investigated this possible alternative and is currently trucking wastewater to the Tampa AWT Plant. Negotiations are underway with the City of Bradenton and with Hillsborough County which operate AWT facilities that discharge to surface waters. These options are limited by the Piney Point facility's capacity to load trucks, the AWT's physical abilities to receive and unload trucks and the AWT's abilities to accept high sulfate wastewater without generating large volumes of nitrogen gas. Alternatives to trucking to the facilities (e.g., rail or temporary pipelines) were also examined by FDEP at the request of EPA, but found infeasible due to the distance involved and the time required to construct the necessary infrastructure. Continuing to truck wastewater to the Tampa AWT Plant is considered to be the only feasible alternative in this category at this time and will remove an estimated 33 MG at a cost of $1.1 to $1.8 million.

Treat and Ship to Other Wastewater Treatment Plants

FDEP and EPA evaluated the feasibility of barging the wastewater to large municipal AWT facilities in other States. One possible location was identified; however, the facility is not authorized to accept industrial waste and local ordinances would have to be changed. In addition, physical modifications would be required at the docking facilities (i.e., dredging) to accommodate the barges and to move the wastewater from the dock to the treatment facility. FDEP and EPA concluded that barging the wastewater to this facility is not immediately feasible.

Transporting the waste to out-of-state industrial waste treatment facilities for disposal was also explored. Two facilities were located as possible options: (1) the Gulf Coast Waste Disposal

Authority (GCWDA) located on the Houston Ship Channel in Texas; and (2) the Dupont Chamber Works facility located in Deepwater, New Jersey. Given the distances involved and the cost of transporting the large volume of wastewater, the GCWDA was considered to be the most viable option for consideration. GCWDA has a large industrial wastewater treatment facility with a capacity of almost 60 million gallons per day. The facility has the capability of denitrifying ammonia and appears to have the ability to effectively treat some volumes of water with similar characteristics to that of the double-limed and aerated Piney Point wastewater.

However, GCWDA has estimated an influent nitrogen load limit of 500 lbs/day. This equates to a treatment rate of 2.4 mgd at a concentration of 25 mg/liter or 1.2 mgd at 50 mg/liter. The dock is capable of accommodating two small barges. One existing barge customer currently utilizes the dock on a regular basis. Most barges that have historically discharged to GCWDA have held less than one million gallons (4,000 tons). At least 10 dedicated 8,300 ton barges (2 million gallons) or seven dedicated 13,000 ton barges/ships would be required to supply the GCWDA with a steady flow of two million gallons per day (the minimum needed consumption rate), which is their current maximum stated capacity to accept Piney Point water. It does not appear that barges of this size can be received at the GCWDA's dock. FDEP and EPA do not consider either to be immediately feasible because of the distances involved in transporting the wastewater, complex logistics, and high transportation costs. The State of Florida will continue to pursue options involving the treatment and shipment of the Piney Point wastewater to other wastewater treatment plants.

Ion Exchange Using Clinoptilolite

Review of the application by EPA's Region 8 Office of Research & Development Hazardous Substances Technical Liaison resulted in a recommendation for evaluation of additional treatment by ion exchange to remove excess ammonia. FDEP has reviewed this recommendation and determined that, due to the presence of sodium concentrations in the wastewater, the clinoptilolite will not perform as well as reported in the literature. Tests were actually conducted at Piney Point in the 1980's and the clinoptilolite was found to be far less effective than the aeration process currently being used. Additionally, in order to avoid scaling or biofouling of the ion exchange resin, the water must be filtered. The wastewater at Piney Point has been extremely difficult to filter and requires advanced filtration techniques that are currently being tested on site. The ion exchange would also result in a significant volume of ammonium sulfate solution waste that would have to be managed. As a result, the FDEP determined that this alternative is not feasible at this time.

Add Chemicals Directly to the Ponds to Precipitate Pollutants

The addition of lime directly into a pond to treat the water is possible if done on a limited scale in a small compartment containing partially treated wastewater. FDEP is planning to convert

one of the existing cooling ponds into a sludge storage/treated water compartment. However, the addition of lime into a pond without extensive mixing would cause much of the free lime to settle, thus consuming storage capacity without yielding much benefit. The addition of lime in *all* impoundments at the site in order to precipitate the contaminants does not alleviate the threat to human health and safety caused by the hydraulic characteristics of a dike failure. Also, ammonia concentrations would remain as high as 500 mg/liter without air stripping. This alternative raises other significant technical concerns. By converting the existing ponds into large treatment systems, FDEP would have to treat larger volumes of wastewater because all water draining from the stacks (including interstitial pore water) would now have to be re-circulated to the top of the dikes for treatment. As a result, FDEP would have to ultimately treat as much as two billion gallons of water. The logistics of treating all this water in short order are significant, and the quantity of lime required is not readily available.

Of those additional treatment alternatives considered, only continued RO discharges to Bishop Harbor (82.5 MG) and trucking treated wastewater to the Tampa AWT Facility (33 MG) are considered feasible at this time.

Surface Water Discharges of Double-Lime Treated Waste

Discharges of partially treated wastewater (double-lime with aeration) to surface waters in the vicinity have been evaluated by FDEP and EPA. These included discharges to Bishop Harbor and Tampa Bay.

Discharge to Bishop Harbor

The facility is currently discharging double-lime with aeration treated wastewater to Bishop Harbor under an Emergency Order. This order allows such discharges until May 31, 2003, but could be rescinded early if adverse impacts in the Harbor occur. With the onset of warmer water temperatures in March, adverse impacts to Bishop Harbor, an aquatic preserve, and Tampa Bay are likely to grow more severe. Signs of impact are already occurring and are expected to become more pronounced. The primary risks and adverse impacts are associated with its nitrogen load and include increased phytoplankton concentrations that attenuate available light to recovering seagrass communities, stimulation of harmful (toxic) algae blooms and increased macroalgae production that can smother seagrasses. As a result of the current discharges, an algal bloom (*Prorocentrum)* has been reported in Bishop Harbor. Blooms of toxic algae in embayments can be an increased risk to human health due to the high potential for human exposure to contaminated water. In addition, increases in primary production of algae can result in anoxia (low dissolved oxygen) conditions that can threaten fish and invertebrates in the bay. Therefore, discharging wastewater in this manner into Bishop Harbor is not considered a feasible option due to the likelihood of significant adverse impacts.

Discharge to Tampa Bay

EPA also evaluated the alternative of constructing a pipeline for a direct discharge of double-lime with aeration treated wastewater to Tampa Bay. It was determined that this alternative would require nearly a year for construction and would require an NPDES permit. Because a TMDL for total nitrogen has been developed for Tampa Bay, before any new discharge could be allowed, offsets would have to be obtained to ensure that overall nitrogen loadings are not increased. Finding sufficient offsets for the size of the Piney Point nutrient loadings would be problematic. Current TMDL allowable nitrogen loadings to Lower Tampa Bay are 349 tons/year. Assuming a nitrogen concentration of 50 mg/l, discharge of 535 million gallons of the treated wastewater would result in an additional 111 tons of nitrogen or an increase of 32 percent over existing loads. Point sources alone for Middle (78 tons/year) and Lower (1 ton/year) Tampa Bay combined only equate to 79 tons/year. Therefore, this alternative has been determined to be infeasible.

The consumption of wastewater from Piney Point, through discharges of partially treated wastewater to Bishop Harbor for the month of February is 44.9 MG. This option will need to be halted due to impacts to Bishop's Harbor caused by increased algal growth stimulated by the nitrogen.

Summary of Alternatives

FDEP's evaluation of alternatives has been reviewed by EPA regional and technical authorities in the areas of underground injection control, surface water discharges, emergency response, and mining waste remediation. Based on this review, EPA has been unable to find any currently feasible options available beyond the limited options identified above. These reliable options total **165.3 million gallons**, well short of the required **700 million gallons** necessary to alleviate the emergency. However, as discussed later under Permit Conditions, EPA is requiring the FDEP to continue to pursue all avenues for alternatives to the fullest extent possible and implement them as they become available and to evaluate any potential alternative identified by EPA during the life of the permit.

Reliable Alternatives	**Amounts**
1. Treat and Truck to Cargill:	**4.9 MG (reliable)**
2. RO discharges to Bishop Harbor:	**82.5 MG (reliable)**
3. Treat and Truck to Tampa:	**33.0 MG (reliable)**
4. Double-Lime with Aeration to Bishop Harbor (2/1-2/28):	**44.9 MG (reliable)**
Total:	**165.3MG**

4) The public interest requires the issuance of the permit as soon as possible.

This finding must be made in order to issue such a permit without prior notice or tentative determination, pursuant to 40 CFR 222.3(b)(3). Due to the lack of remaining surge capacity at the facility, anticipated rainfall for the remainder of the year, and the start-up delay associated with ocean disposal, there exists an urgency to issue the permit as soon as possible to allow for acceptable levels of wastewater removal in the timeframe needed to prevent overspilling and/or failure of the dikes. Start-up delays are caused by the fact that the permittee cannot commit to the contracts needed to secure the discharge vessels and construct the infrastructure without a permit in hand. As an interim measure the FDEP plans on trucking the double-lime treated wastewater to the barges until the pipeline infrastructure can be constructed.

PART 227 - CRITERIA FOR THE EVALUATION OF PERMIT APPLICATIONS FOR OCEAN DUMPING OF MATERIAL

Compliance with Part 227 Subpart B- Environmental Impact

227.1 (d) Applicability (of water quality standards)

There are no applicable state water quality standards for this project. There are, however, applicable marine water quality criteria, as defined in 227.31. The section on water column determinations below discusses how the requirements of 227.1 (d), with respect to release zone and initial mixing, are met through the application of applicable marine water quality criteria and dilution modeling.

227.4 Criteria for Evaluating Environmental Impact

The applicable prohibitions, limits, and conditions set forth in 227.4 have been satisfied as described below in Sections on Water Column, Suspended and Benthic Determinations.

227.5 Prohibited Materials

The material to be dumped is industrial wastewater that has been evaluated and found to meet the criteria of the ocean dumping regulations. The material approved for disposal is not:

- high level radioactive waste;
- material used for radiological, chemical, or biological warfare;
- materials whose composition and properties have been insufficiently described to enable application of 40 CFR Part 227 Subpart B;
- inert synthetic or natural materials which may float or remain in suspension so as to materially interfere with fishing, navigation, or other use of the ocean;
- medical waste as prohibited by 102(a) of MPRSA.

227.6 Constituents Prohibited as other than Trace Contaminants

The material to be dumped has been evaluated and indicates that the constituents listed in 40 CFR 227.6(a) are not present in other than trace amounts. See Sections on Water Column, Suspended and Benthic Determinations.

Water Column Determinations - 40 CFR 227.6(c)(1) and 227.27(a)

Evaluation of the liquid phase - Water Quality Criteria

Applicable marine water quality criteria, as defined in 40 CFR 227.31, must not be exceeded after initial mixing. Data from samples of lime treated wastewater taken at the Piney Point facility were used for this evaluation. There are applicable marine water quality criteria for constituents in the material, including listed constituents. Ammonia was detected in water samples at the Piney Point facility, and will require a dilution of up to 40 to 1 to meet the Water Quality Criteria (WQC) based on an assumed high end ammonia value of 200 mg/L and a low end WQC value of 5 mg/L (@ salinity of 30 parts per thousand and temperature of 30^{o}C). Preliminary dilution modeling results conducted by EPA utilizing the EPA Visual Plume model indicate the applicable marine water quality criteria will not be exceeded after initial mixing. A dilution of greater than 1000 to 1 was achieved within four hours of disposal and greater than 200 to 1 within 350 meters of disposal. It has been determined that these conditions meet the requirements and intent of 227.1 (d).

Evaluation of the liquid phase - Liquid Phase Bioassay

Liquid phase bioassays run as part of the suspended particulate phase on three appropriate sensitive marine organisms must show that after initial mixing (as determined under 40 CFR 227.29(a)(2)), the liquid phase of the material will not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic to appropriate sensitive marine organisms. Bioassays utilizing two species (Americamysis bahia, Menidia beryllina) were conducted for samples taken at the Piney Point facility on February 25, 2003. LC_{50} values were greater than 100%. A dilution of 100 to 1 is needed to meet the toxicity threshold of 0.01 of the LC_{50}. As discussed in the previous paragraph adequate dilutions are achieved.

Liquid phase bioassays were performed on only two of the three required species due to the short time frame for setting up the tests as a result of the emergency situation. However, test results indicate that this material would most likely have a similar effect on a third test species and, accordingly, EPA staff anticipate that the liquid phase of the material will be in compliance with 40 CFR 227.6(c)(1) and 227.27(a).

Even if final test results indicate that the listed material may be present in greater than trace amounts, EPA regulations do not preclude the issuance of an emergency permit for the dumping of such material. 40 CFR 227.6(a). However, EPA expects FDEP to complete the necessary tests and will modify the permit if those test results indicate the need to do so.

Suspended Particulate Phase Determination - 40 CFR 227.6(c)(2) and 227.27(b)

Suspended particulate phase bioassay testing of the material using three appropriate sensitive marine organisms must show that after initial mixing (as determined under 40 CFR 227.29(a)(2)), the suspended particulate phase of this material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic in the laboratory bioassays, and thus would not result in significant mortality. The factor of 0.01 is applied to ensure that there will be no significant adverse sublethal effects. Bioassays utilizing two species (Americamysis bahia, Menidia beryllina) were conducted for samples taken at the Piney Point facility on February 25, 2003. LC_{50} values were greater than 100%. A dilution of 100 to 1 is needed to meet the toxicity threshold of 0.01 of the LC_{50}. As discussed in section on water quality criteria compliance, adequate dilutions are achieved.

Suspended phase bioassays were performed on only two of the three required species due to the short time frame for setting up the tests as a result of the emergency situation. However, test results indicate that this material would most likely have a similar effect on a third test species and, accordingly, EPA staff anticipate that the suspended particulate phase of the material will be in compliance with 40 CFR 227.6(c)(1) and 227.27(a).

As discussed above, even if final test results indicate that the listed material may be present in greater than trace amounts, EPA regulations do not preclude the issuance of an emergency permit for the dumping of such material. 40 CFR 227.6(a). EPA expects FDEP to complete the necessary tests and will modify the permit if those test results indicate the need to do so.

Benthic Determinations - 40 CFR 227.6(c)(3) and 227.27(b)

This material does not contain any solid material that will reach the ocean floor and have a benthic impact. Accordingly, the solid phase of the material does not cause significant mortality and meets the solid phase toxicity criteria of 40 CFR 227.6(c)(3) and 227.27(b).

227.7 Limits Established for Specific Wastes or Waste Constituents

The wastewater does not contain any of the described constituents under this subpart.

227.8 Limitations on the Disposal Rates of Toxic Wastes

The wastewater does not exceed the LPC as defined in 227.27

227.9 Limitations on Quantities of Waste Materials

Section 227.9 provides that substances that may cause damage to the ocean environment (due to the quantities in which they are dumped) or seriously reduce amenities may be dumped only when the quantities to be dumped at a single time and place are controlled to prevent long-term damage to the environment or amenities. The material will be disposed of at a defined area across the northeastern Gulf of Mexico. The proposed wastewater has been tested and found to meet the requirements of 40 CFR 227.6 and 227.27, as described previously. The proposed disposal will be in the amount of approximately 534.7 million gallons. In addition, disposal operations will be managed to assure disposal takes place within the site boundaries and that rapid dilution is achieved. It is concluded that the proposed disposal would not cause long-term damage to amenities or the environment due to the quantities in which it would be dumped.

227.10 Hazards to Fishing, Navigation, Shorelines, or Beaches

Section 227.10 provides that with regard to the dumping of material, the site and conditions must be such that there is no unacceptable interference with fishing or navigation and no unacceptable danger to shorelines or beaches resulting from wastewater disposal. The project material proposed for dumping would not interfere with fishing, navigation, or pose unacceptable danger to shorelines or beaches. The distance from shorelines and beaches as well as the transitory nature of the dumping activities will preclude any interference with such activities.

227.11 Containerized Wastes

The waste will not be containerized.

227.12 Insoluble Wastes

Suspended solid material in the waste will be rapidly dispersed without damage to benthic, demersal, or pelagic biota. There should be no floatable materials in the waste.

227.13 Dredged Materials

The material to be dumped is not dredged material and therefore this paragraph does not apply.

Compliance with Part 227 Subpart C - Need for Ocean Dumping

The final determination for the need for ocean dumping is made based on the application, and all associated documents, for an emergency permit.

227.14 Criteria for Evaluating the Need for Ocean Dumping and Alternatives to Ocean Dumping; 227.15 Factors Considered; 227.16 Basis for Determination of Need for Ocean Dumping

The requirements of this subpart and sections 227.14, 227.15, and 227.16 are addressed in the justification for granting the emergency permit above.

Compliance with Part 227 Subpart D - Impact of the Proposed Dumping on Esthetic, Recreational and Economic Values

40 CFR Section 227 Subpart D sets forth the factors to be considered when evaluating the impact of proposed dumping on aesthetic, recreational, and economic values, including the potential for affecting recreational and commercial uses and values of living marine resources.

The factors specifically considered include recreation and commercial uses, water quality, the nature and extent of disposal operations, visible characteristics of the material to be disposed, presence of pathogens, toxic chemicals, bioaccumulative chemicals, or any other constituent which can affect living marine resources of recreational or commercial value. These would be used in an overall assessment of the proposed dumping on aesthetic, recreational, or economic values, and possible alternative methods of disposal or recycling. See 40 CFR 227.17, 227.18, and 227.19.

The Environmental Impact Statement (EIS) for the Tampa ODMDS designation, a disposal site to the east of the permitted site, discusses the potential impacts of dredged material disposal at the site on recreational fisheries, commercial fisheries, shore recreation, and cultural resources with regard to disposal of dredged material at the site. The alternatives analysis within the EIS included ocean alternatives within the proximity of the permitted site. Similar impacts from the elutriate and suspended phases of dredged material disposal can be inferred to impacts as a result of the Piney Point wastewater dispersal.

The material is treated wastewater and, when ocean disposed, will quickly disperse, leaving no visible plume a short time after disposal. There are no known sources of potential pathogens that could have specifically impacted the project wastewater. On the basis of the discussion in the Tampa ODMDS EIS and the findings of this memo, it is not expected that adverse impacts to the above amenities would occur.

With respect to 40 CFR 227.17(b)(2), if the dumping were not authorized there would be an adverse

economic impact on the immediate locality of the facility, and on the State of Florida. A catastrophic failure of the containment dikes at the facility would endanger human lives and result in an economic burden on the State. Failure to approve this project could in the case of dike failure/breach also adversely impact recreational boating or aesthetic values in Bishop's Harbor and Tampa Bay due to widespread mortality of the flora and fauna due to a major spill of the untreated wastewater, and potential human health and safety issues which may require restricted use of the bay.

Compliance with Part 227 Subpart E - Impact of the Proposed Dumping on other Uses of the Ocean

40 CFR Part 227, Subpart E sets forth the factors to be considered in evaluating the impacts of the proposed dumping on other uses of the ocean, including long range impacts. Specifically, the uses considered include, but are not limited to, commercial and recreational fishing in open ocean areas, coastal areas, and estuarine areas; recreation and commercial navigation; actual or anticipated exploitation of living and non-living marine resources; and scientific research and study. An overall assessment of the proposed dumping on the temporary and long range effects of other uses of the ocean would include consideration of irreversible or irretrievable commitment of resources that would result from the proposed dumping.

The Tampa ODMDS EIS addresses the effects of dredged material disposal on public health and safety (including navigational hazards) and the effects on the ecosystem (biota and water column). It also addresses the environmental effects and mitigative measures that are short-term, long-term, or involve the irreversible or irretrievable commitment of resources. Although the Piney Point waste is not dredged material, its disposal effects can be considered similar to that of the elutriate and suspended phases of dredged material. In addition, operationally, disposal will be similar in that either barges or ships will be used as a conveyance mechanism. Based upon the discussion in the EIS, and the findings in this memo, it is concluded that there would be no adverse impact on the uses to be considered under 40 CFR Part 227 Subpart E, incorporating considerations of long-term impacts (40 CFR 227.20(a)) and an evaluation on an individual basis for effects on uses of the ocean for purposes other than ocean dumping (40 CFR 227.20(b)).

CRITERIA FOR THE MANAGEMENT OF DISPOSAL SITES FOR OCEAN DUMPING - PART 228

228.4 Procedures for designation of sites.

The site chosen for this emergency action is specified in the permit and was based on an individual appraisal of the characteristics of the waste and the safest means for its disposal.

228.5 General criteria for the selection of sites.

Five general criteria are used in the selection and approval for continuing use of ocean disposal sites. Sites are selected so as to minimize interference with other marine activities, to prevent any temporary perturbations associated with the disposal from causing impacts outside the disposal site, and to permit effective monitoring to detect any adverse impacts at an early stage. Where feasible, locations off the Continental Shelf and other sites that have been historically used are to be chosen. If, at any time, disposal operations at a site cause unacceptable adverse impacts, further use of the site can be restricted or terminated by EPA. The disposal site was chosen to comply, to the extent practical for an emergency action, with the five general criteria. The majority of the site is located beyond the Shelf break.

The site was chosen and specified (i.e., location, depths, size) to minimize interference and prevent impacts outside its boundaries. The site and its use can be modified by modification of the permit.

228.6 Specific criteria for site selection.

1. Geographical position, depth of water, bottom topography, and distance from coast [40 CFR 228.6(a)(1)].

All disposal shall be limited to waters west of longitude 83º 32' W (depths of at least 40 meters), bounded on the north by a latitude of 27º 37' N and to the south by 27º11' N. Once the barge reaches the 100 meter contour, the disposal is bounded to the north by 29º11' N maintaining a 40 nautical mile minimum distance from shore (and minimum depth of 100 meters) and to the south by 27º11' N. All disposal must be completed prior to reaching a longitude of 87º 00' W just east of the Florida and Alabama border. Bottom topography is highly variable throughout this site, with depths ranging from 40 meters to 3600 meters. The minimum distance of any disposal activity from the coast is approximately 40 nautical miles. The disposal area lies entirely within the U.S. Exclusive Economic Zone (EEZ).

2. Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases [40 CFR 228.6(a)(2)].

The location and specifications mandated by the permit avoid or distance disposal activities from known areas. The site was specified to prevent disposal over the Florida Middle Grounds and another fishing resource known as The Elbow.

3. Location in relation to beaches and other amenity areas [40 CFR 228.6(a)(3)].

The site location keeps dumping activities at least 40 nautical miles from beaches along the Gulf coast of Florida. As stated above, this site was specified to prevent disposal over the Florida Middle Grounds

and another fishing resource known as The Elbow. Depending upon the specific route the disposal vessels may take, disposal could occur at least 4 nautical miles from The Elbow and approximately 40 nautical miles from the Florida Middle Grounds. Due to the expected rapid dilution of the treated wastewater (1000 to 1 within a half of mile of the discharge), the distance to the beaches and amenity areas and the currents in the area, no measurable amount of wastewater is expected to reach the beaches or amenity areas.

4. Types and quantities of wastes proposed to be disposed of, and proposed methods of release, including methods of packing the waste, if any [40 CFR 228(a)(4)].

The waste being authorized for disposal into ocean waters is treated process wastewater from the former Piney Point Phosphates, Inc. phosphate fertilizer manufacturing complex. The permit authorizes 534.7 million gallons (2.034 million metric tons) of waste to be disposed at sea.

Additionally, quantities are limited to that necessary to alleviate the emergency situation. Quantities shall be reduced by a quantity directly proportional to quantities consumed by alternative disposal options, which are expected to be about 165.3 million gallons.

Disposal from the vessel shall be through a single discharge opening at one time located within 6 6 meters of the water surface or at or above the water line. Discharge openings shall have a maximum diameter of 20 inches and the average rate shall not exceed 4,000 gallons per minute. In addition, vessel speed during disposal must average greater than 4 knots. All disposal must occur while underway while within the disposal site. If ballast tanks are used for the transport of the waste, adequate flushing of the tanks is required to remove an estimated 99.9 percent of the waste from the tanks.

5. Feasibility of surveillance and monitoring [40 CFR 228.6(a)(5)].

Surveillance and monitoring are more feasible on the eastern extremes of the site, where the majority of disposal activities are anticipated. Monitoring and surveillance within the majority of the site is generally deemed feasible only by the barge itself, ship riders or by satellite imagery.

6. Dispersal, horizontal transport and vertical mixing characteristics of the area including prevailing current direction and velocity, if any [40 CFR 228.6(a)(6)].

Currents in the eastern extremes of the dump site are primarily influenced by detached cyclonic eddies from the Gulf Loop Current, tides and by wind inducement. Average circulatory current direction has two seasons, summer and winter. Circulatory currents are generally southward in winter and northward in the summer. Tidal currents are generally in the east-west direction. Bottom currents are generally parallel in direction to the surface currents, however, they can occasionally differ by 180^{o}. The Loop Current front will likely reach this site with a frequency of less than 5%. The frontal eddies associated

with the Loop Current are rotating, westward translating masses of relatively warm water. [Source: Final Environmental Impact Statement for the Designation of an Ocean Dredged Material Disposal Site Located Offshore Tampa, Florida. September, 1994]

Currents in the rest of the site are dominated by the Loop Current and detached cyclonic eddies along its northern boundary. The general overall net transport is clockwise. Influence by the cyclonic eddies is seasonal and highly variable.

7. Existence and effects of current and previous discharges and dumping in the area (including cumulative effects) [40 CFR 228.6(a)(7)].

The dumping of dredged material at the EPA Tampa ODMDS has been occurring since 1981. The ODMDS is located approximately 22 nautical miles to the east of the site's eastern boundary. The monitoring done at this site has not shown any adverse impacts due to the dumping activities.

Gulfstream Natural Gas System, L.L.C. conducted two hydrostatic pressure tests under the Clean Water Act (NPDES) on various segments of their marine natural gas pipeline, resulting in test water discharges of approximating 140 million gallons in St. Petersburg Block 372 (60 foot depths), approximately 20 miles south southwest of St. Petersburg, Florida. The effluent was treated seawater containing phosphates.

8. Interference with shipping, fishing, recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the ocean [40 CFR 228.6(a)(8)].

Site boundaries, the eastern-most extremes in particular, were chosen to avoid such interference, with special attention given to a proposed mariculture facility located to the south. Although a portion of the area overlaps with the Tampa Shipping Safety Fairway, no interference with shipping activities are expected. The fairway only prohibits the permitting of any artificial island or fixed structure. Disposal at this site is not expected to interfere with any of the other uses of the ocean.

Disposal within the western portions of the site is deemed flexible enough to adjust accordingly to avoid interfering with such activities. The depth restriction of this site was chosen to avoid interference with fishing and recreational activities at the Florida Middle Grounds and The Elbow (both of which are known recreational areas).

9. The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys [40 CFR 228.6(a)(9)].

EPA assessed candidate disposal sites for disposal of dredged material in the vicinity of the selected site through characterization studies. Results from these studies are described in the Tampa ODMDS

EIS. Data from these studies showed the water quality and ecological functions within this area to be typical of the Gulf coast offshore waters. The permitted site can only be assessed by a review of the literature containing general oceanic data collected from the northern Gulf of Mexico. Water quality is seasonal according to "Assessment of Currents and Hydrography of the Eastern Gulf of Mexico" (Ichiye, Kuo & Carnes, Texas A&M, 1973). Additional information regarding the water quality and ecology in this area can be found in the following resources: "Southwest Florida Shelf Benthic Communities Study Year 5 Annual Report" (Danek, et. al, 1986); "Deep Basin Oceanographic Conditions and General Circulation" (Molinari et. al, 1975); "Gulf of Mexico Physical Oceanography Program, Final Report: Year 5" (SAIC, 1989); "Southwest Florida Shelf Ecosystem Study" (US Minerals Management Service, 1985).

10. Potentiality for the development or recruitment of nuisance species in the disposal site [40 CFR 228.6(a)(10)].

The potential for recruitment of nuisance species is expected to be limited to development of Harmful Algal Blooms(HAB). The eastern boundary (at least 40 nautical miles from the coastline) was selected to minimize the potential for HAB development based on recommendations by the Florida Fish and Wildlife Conservation Commission. Research has suggested that red tides generally develop closer to the beach, within a "Zone of Initiation" generally considered to be within 10 to 40 nautical miles of shore (Steidinger, Karen A. Basic Factors Influencing Red Tides. Proceedings of the First International Conference on Toxic Dinoflagellate Blooms. November, 1974.)

11. Existence at or in close proximity to the site of any significant natural or cultural features of historical importance [40 CFR 228.6(a)(11)].

An internet review of the National Park Service Maritime Landmarks database the northeastern Gulf of Mexico did not reveal the presence of any such areas. During the Tampa ODMDS site characterization studies, no natural or cultural features of historical value were identified in the vicinity of candidate disposal sites east of the permitted site. Studies did show the presence of a sunken vessel just north of the Tampa ODMDS or approximately 20 nautical miles from the permitted site. However, attempts to identify the name and age of the vessel were unsuccessful, making it impossible to determine its historical significance. The nearest cultural feature of historical importance would have to be onshore, distancing dumping activities by at least 40 nautical miles.

228.8 Limitations on times and rates of disposal.

Limits on rates of discharge and vessel speed have been specified to maximize dilution of the waste.

228.9 Disposal site monitoring.

EPA is requiring the applicant to submit an environmental monitoring plan for approval prior to initiation

of any disposal at sea. The primary focus of this plan must be related to the development of Harmful Algal Blooms.

228.10 Evaluating disposal impact.

Following completion of and during disposal activities, EPA will evaluate the impact of disposal. The following types of effects, in addition to other necessary or appropriate considerations, will be considered in determining to what extent the marine environment has been impacted: 1) movement of materials into estuaries or marine sanctuaries, or onto oceanfront beaches, or shorelines; 2) movement of materials toward productive fishery or shellfishery areas; 3) absence from the disposal site of pollution-sensitive biota characteristic of the general area; 4) progressive, non-seasonal, changes in water quality or sediment composition at the disposal site, when these changes are attributable to materials disposed of at the site; 5) progressive, non-seasonal, changes in composition or numbers of pelagic, demersal, or benthic biota at or near the disposal site, when these changes can be attributed to materials disposed of at the site; and 6) accumulation of material constituents (including without limitation, human pathogens) in marine biota at or near the site. Impacts will be categorized as either Impact Category I or Impact Category II.

228.11 Modification in disposal site use.

A determination of Impact Category I or a determination that disposal has resulted, or is resulting, in substantial harm, or may result in imminent and substantial harm to human health or welfare or the marine environment will result in a modification of the disposal site(s) as necessary to reduce impacts to acceptable levels.

CONSULTATIONS

EPA has initiated various consultations in connection with the review of this application.

Consultation with the Department of State

Article V(2) of the London Convention provides that a Party may issue a special permit for the dumping of wastes or other matter listed in Annex 1 of the Convention (which includes industrial waste) in emergencies, "posing an unacceptable risk to human health and admitting of no other feasible solution." Before doing so, the Party is required to consult any affected countries and the International Maritime Organization "which after consulting other Parties, and international organizations as appropriate, shall... promptly recommend to the Party the most appropriate procedures to adopt. The Party shall follow these recommendations to the maximum extent feasible consistent with the time within which the action must be taken and with the general obligation to avoid damage to the marine environment and shall inform the Organization of the action it takes..."

EPA Headquarters staff initiated informal consultation with the Department of State on February 26, 2003 and continues to work with State Department regarding formal consultation required by the London Convention.

Consultation with the Department of Commerce

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act provides that "...Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded or carried out by such agency...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of such species which is determined by the Secretary...to be critical..."

The applicable regulations at 50 CFR Part 402 provide the framework for the consultation process and include a reference to emergencies, allowing for completion of consultation at a later time. EPA initiated consultation with the National Marine Fisheries Service in this case by telephone on February 13, 2003.

Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act also involve consultation with the National Marine Fisheries Service regarding Essential Fish Habitat. The applicable regulations 50 CFR Subpart K provide for consultation by Federal

agencies regarding "... any of their actions authorized, funded or undertaken or proposed to be authorized, funded or undertaken that may adversely affect EFH.

These regulations also reference emergency situations and provide, in pertinent part:

> Consultation is required for emergency federal actions that may adversely affect EFH, such as hazardous material cleanup, response to natural disasters or actions to protect public safety. Federal agencies should contact NMFS early in the emergency response planning, but may consult after-the fact if consultation on an expeditied basis is not practicable before taking the action.
>
> 50 CFR 600.920(a)

EPA initiated consultation with the National Marine Fisheries Service relative to these provisions by telephone on January 17, 2003.

Consultation with a panel of experts assembled Tampa Bay Estuary Program (TBEP)

In assistance to EPA, the TBEP staff sought the advice of colleagues in the central and eastern Gulf of Mexico regions with expertise in assessing the causes and consequences of harmful algae blooms. Scientists from the Louisiana Universities Marine Consortium (LUMCON), the Florida Marine Research Institute, EPA's marine research laboratory at Gulf Breeze, Mote Marine Laboratory, the University of South Florida and other stakeholder groups participated in a conference call hosted by the TBEP on February 21, 2003. Each of the experts participating in the call was asked specifically for his/her assessment of the comparative ecological and human health risks of the two proposed Gulf of Mexico dispersion options versus continuation of the discharge into lower Tampa Bay. The unanimous consensus among the scientists was that dispersing the ammonia-enriched wastewater in the Gulf of Mexico posed fewer ecological and health risks than continuing the discharge into Tampa Bay. The panelists emphasized that ocean dispersion should be used only as a stopgap measure in the short term until other options were implemented to relieve the emergency conditions.

The greatest risk posed by the offshore dispersion option was the triggering of a harmful algae bloom that subsequently moved into coastal waters. There was a strong consensus among the scientists that the further offshore the better and that no discharge should occur within 40 nautical miles of shore to reduce the risk of an offshore bloom moving onshore.

Several actions were recommended to minimize the potential impact of offshore dispersion including: determining the discharge pattern with the least probability of affecting coastal waters; avoiding entrainment in the eastern Gulf loop current; and applying appropriate circulation models e.g. the Princeton Ocean Model and the Weisberg model to help determine the safest dispersion strategy.

Some suggestions were offered for monitoring the effects of an ocean dispersion option if it were permitted. It was suggested that satellite imagery might be useful but that discharges more than 40 nautical miles offshore as recommended would likely be outside the detection range of the existing network of monitoring buoys in the eastern Gulf. A suggestion was made to equip vessels releasing the wastewater with an array of sensors to verify that dispersion was occurring through measurements of salinity and/or ammonia.

SUMMARY OF PERMIT CONDITIONS

Limitations on Quantities

Quantities in the permit are initially set at 534.7 million gallons (2.034 metric tons) of double-lime with aeration treated wastewater. This volume is based on a determined need for consumption (treatment and disposal/re-use) of a total of 700 million gallons of wastewater from February 1, 2003 to November 30, 2003. The total volume has been adjusted by the amounted consumed through February 28, 2003 through discharge to Bishop Harbor (44.9 million gallons) and the amount predicted

to be consumed from February 1, 2003 to November 30, 2003 through reliable alternatives (120.4 million gallons). EPA is requiring the FDEP to continue to pursue all avenues for alternatives to the fullest extent possible and implement them as soon as they become available and to evaluate any potential alternative identified by EPA during the life of the permit. Additionally, the permit requires monthly status reports of the integrity of the facility, the rainfall received, amount consumed and the status of the development and implementation of alternatives. Based on the information in these reports, the disposal quantities under this permit will be revised on a monthly basis beginning in May, 2003.

Waste Monitoring Requirements

The characteristics of the waste to be disposed in the ocean will be monitored through collection samples at the end of the treatment stream. NH3-N and pH will be measured from each sample to assess the effectiveness of the double-lime with aeration treatment process. Additionally, in order to evaluate whether constituents listed in 40 CFR 227.6(a) are present as other than trace contaminants, toxicity tests following methods described in the Green Book will be conducted on the first sample collected. Additional toxicity tests will be required if the thresholds of 50, 100, 150 or 200 mg/l for NH3-N are exceeded. A toxicity test resulting in a limiting permissible concentration that can be met by the dilution achieved during disposal will not need to be repeated at the corresponding NH3-N threshold. If the next higher threshold is exceeded, a new toxicity test will be required. If results from any toxicity tests indicate that the limiting permissible concentration will not be met, modifications to the disposal method will be instituted as necessary.

Additionally, the FDEP is required to institute a waste monitoring program to insure that no contaminants are entrained in the wastewater as a result of contact with the transmission infrastructure (transmission pipeline, surge storage tanks, vessel storage tanks).

Disposal Monitoring Requirements

In order to insure and document that disposal occurs in accordance with the terms of the permit, the FDEP is required to monitor and report data regarding the position of the disposal vessel in route to and during disposal. The data will be available for review within 24 hours of each disposal event and will reported on a monthly basis. In addition to position data, the permittee is required to report on the observance of any marine mammals and to report on oceanographic conditions to assist in assessment of environmental impact.

Environmental Monitoring Requirements

The main concern regarding potential adverse impacts centers around the concern that disposal could trigger a harmful algae bloom that subsequently could move into coastal waters. As discussed above, the TBEP recommended verifying dispersion is occurring and in what amounts through the use of a

conservative tracer. The permit requires that the FDEP develop a monitoring program subject to EPA approval that addresses these concerns.

Disposal Location

All disposal shall be limited to waters west of longitude 83° 32' W (depths of at least 40 meters), bounded on the north by a latitude of 27° 37' N and to the south by 27°11' N. Once the barge reaches the 100 meter contour, the disposal is bounded to the north by 29°11' N maintaining a 40 nautical mile minimum distance from shore (and minimum depth of 100 meters) and to the south by 27°11' N. All disposal must be completed prior to reaching a longitude of 87° 00' W. Bottom topography is highly variable throughout this site, with depths ranging from 40 meters to 3600 meters. The minimum distance of any dumping activity from the coast is approximately 40 nautical miles. These boundaries were selected for the following reasons:

- maintain disposal activities at least 40 nautical miles from shore and outside the HAB zone of initiation as described by Karen Steidinger.

- maintain disposal activities away from critical resource areas such as The Elbow and the Florida Middle Grounds.

- maintain disposal activities offshore Florida State waters.

- maintain disposal activities at a distance of greater than 100 nautical miles from the Hypoxic Zone.

- maintain disposal activities within the U.S. Exclusive Economic Zone (EEZ).

- maintain disposal activities outside of the “Forbidden Zone” as described by Yang et. al.